

All-In-One Optical Integrated Circuitry Based On 3D Cubic Photonic Crystals

I. El-Kady^{1,2}, and M. F. Su²

1: Sandia National Labs, Org 1743, Albuquerque, New Mexico, USA

2: Department of Electrical and Compute Engineering, University of New Mexico,
Albuquerque, New Mexico, USA

Finite difference time domain (FDTD) analysis is used to investigate the viability of 3D cubic photonic crystals for optical integrated circuitry. We demonstrate theoretically how such crystals can be used to create various optical components including: in and out of plane straight, 90°, and staggered optical interconnects. We also address the viability of implementing such crystals in T- and Y-splitters, optical switches, and channel-drop filters. We further address how multi-stage optical integration of these components can be achieved, and thus the premise of an all-in-one optical integrated circuit.

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